

**Notice of Allowability**

Application No.

10/656,619

Examiner

Tuan T Dinh

Applicant(s)

AWAKURA ET AL.

Art Unit

2841

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 10/01/04.
2. ☒ The allowed claim(s) is/are 1-2,4-7,9-19,23-24,26-28,30-39 (renumber claims are 1-32).
3. ☒ The drawings filed on 05 September 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)           |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|   | 9. <input type="checkbox"/> Other _____   |

## DETAILED ACTION

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Bradley Ruben (Reg. No. 32,058) on 11/19/04.

The application has been amended as follows: to overcome the references cited.

**Cancel claims 8 and 29 without prejudice.**

Claims 1, 4-5, 15-17, 19, 31-33, 35-36, and 38-39 would be amended such as below:

1. (Currently amended.) A wiring board, comprising:  
an insulative base material;  
conductor patterns formed thereon;  
a magnetic thin film formed on at least one of said conductor patterns and  
configured of a magnetic loss material,  
said magnetic loss material having a composition represented by M-X-Y, where  
M is at least one of Fe, Co and Ni, X is at least one element other than M or Y, and Y is  
at least one of F, N and O, in which a maximum value  $\mu''_{\max}$  of loss factor  $\mu''$  that is  
imaginary component in complex permeability of said magnetic loss material exists

within a frequency range of 100 MHz to 10 GHz; said magnetic loss is a narrow-band magnetic loss material having a relative bandwidth bwr not smaller than 200% where the relative bandwidth bwr is obtained by extracting a frequency bandwidth between two frequencies at which the value of  $\mu''$  is 50% of the maximum  $\mu''_{\max}$  and normalizing the frequency bandwidth at the center frequency thereof; and

said magnetic thin film being formed with an insulation layer interposed therebetween that covers the entirety of the surface of said wiring board on which said conductor patterns are formed.

4. (Current amended.) The wiring board according to ~~claim 2~~ claim 1, wherein said base material is configured of a flexible material.

5. (Current amended.) The wiring board according to ~~claim 4~~ **claim 1**, wherein said flexible **base** material is a **flexible** polyimide.

15. (Current amended.) The wiring board according to ~~claim 8~~ **claim 1**, wherein said magnetic loss material exhibits a DC electrical resistivity that is within a range of 100  $\mu\Omega\cdot\text{cm}$  to 700  $\mu\Omega\cdot\text{cm}$ .

16. (Currently amended.) ~~The wiring board according to claim 1~~ A wiring board, comprising:

an insulative base material;

conductor patterns formed thereon;

a magnetic thin film formed on at least one of said conductor patterns and configured of a magnetic loss material,

said magnetic loss material having a composition represented by M-X-Y, where M is at least one of Fe, Co and Ni, X is at least one element other than M or Y, and Y is at least one of F, N and O, in which a maximum value  $\mu''_{\max}$  of loss factor  $\mu''$  that is imaginary component in complex permeability of said magnetic loss material existing within a frequency range of 100 MHz to 10 GHz; wherein said magnetic loss material is a broad band magnetic loss material having a relative bandwidth bwr not greater than 150% where the relative bandwidth bwr is obtained by extracting a frequency bandwidth between two frequencies at which the value of  $\mu''$  is 50% of the maximum  $\mu''_{\max}$  and normalizing the frequency bandwidth at the center frequency thereof.

17. (Currently amended.) The wiring board according to ~~claim 4~~ **claim 16**, wherein the size of the saturation magnetization of said magnetic loss material is within the range of 60% to 35% of the saturation magnetization of a metal magnetic body consisting solely of the M component.

19. (Currently amended.) A wiring board, comprising:  
a board of at least one layer comprising a conductor pad, said conductor pad comprising signal line conductor patterns, and  
a magnetic thin film deployed at least on pad of said board or said conductor part, and being deployed with an insulation layer interposed therebetween so as to cover said conductor patterns. wherein said magnetic thin film is configured of a magnetic loss material represented by M-X-Y. where M is at least one of Fe, Co, and Ni, Y is at least one of F, N, and O, and X is at least one element other than M or Y, in the

which maximum value of  $\mu''_{\max}$  of loss factor  $\mu''$  that is the imaginary component in the complex permeability of said magnetic loss material exists within a frequency range of 100 MHz to 10 GHz; and said magnetic loss material is a broad-band magnetic loss material having a relative bandwidth bwr not greater than 150% where the relative bandwidth bwr is obtained by extracting a frequency bandwidth between two frequencies at which the value of  $\mu''$  is 50% of the maximum  $\mu''_{\max}$  and normalizing the frequency bandwidth at the center frequency thereof.

31. (Currently amended.) The wiring board according to ~~claim 29~~ **claim 19**, wherein said magnetic loss material exhibits a DC electrical resistivity having a value larger than  $500 \mu\Omega\cdot\text{cm}$ .

32. (Currently amended.) ~~The wiring board according to claim 19~~ A wiring board, comprising:

a board of at least one layer comprising a conductor pad, said conductor pad comprising signal line conductor patterns, and

a magnetic thin film deployed at least on pad of said board or said conductor part, and being deployed with an insulation layer interposed therebetween so as to cover said conductor patterns. wherein said magnetic thin film is configured of a magnetic loss material represented by M-X-Y. where M is at least one of Fe, Co, and Ni, Y is at least one of F, N, and O, and X is at least one element other than M or Y, in the which maximum value of  $\mu''_{\max}$  of loss factor  $\mu''$

**that is the imaginary component in the complex permeability of said magnetic loss material exists within a frequency range of 100 MHz to 10 GHz;**

wherein said magnetic loss material is a narrow-band magnetic loss material having a relative bandwidth bwr not greater than 200% where the relative bandwidth bwr is obtained by extracting a frequency bandwidth between two frequencies at which the value of  $\mu''$  is 50% of the maximum  $\mu''_{\max}$  and normalizing the frequency bandwidth at the center frequency thereof.

33. (Currently amended.) The wiring board according to ~~claim 19~~ **claim 32**, wherein size of saturation magnetization in said magnetic loss material is within a range of 80% to 60% of saturation magnetization of a metal magnetic body consisting solely of M component.

35. (Currently amended.) The wiring board according to ~~claim 19~~ **claim 32**, wherein X component of said magnetic thin film is at least one of C, B, Si, Al, Mg, Ti, Zn, Hf, Sr, Nb, Ta, and rare earth elements.

36. (Currently amended.) The wiring board according to ~~claim 19~~ **claim 32**, wherein, in said magnetic loss material, said M exists in a granular form dispersed in matrix of said X-Y compound.

38. (Currently amended.) The wiring board according to ~~claim 19~~ **claim 32**, wherein said magnetic loss material exhibits an anisotropic magnetic field  $H_k$  of 600 Oe ( $5.34 \times 10^4$  A/m) or less.

39. (Currently amended.) The wiring board according to ~~claim 19~~ **claim 32**, wherein said magnetic loss material is selected from  $\text{Fe}_\alpha\text{Al}_\beta\text{O}_\chi$  and  $\text{Fe}_\alpha\text{Si}_\beta\text{O}_\chi$

***Allowable Subject Matter***

2. Claims 1-2, 4-7, 9-19, 23-24, 26-28, and 30-39 are allowed (renumber claims are 1-32).

The following is an examiner's statement of reasons for allowance: the references cited disclose a wiring board comprising an insulative base material, conductor patterns formed on the base material, a magnetic thin film formed on one of the patterns configured of a magnetic loss material represented by M-X-Y material, and some other claimed elements. However, they do not disclose or render obvious in combination of the magnetic loss material is a narrow and broad band magnetic loss material having a relative bandwidth bwr not greater than 150% or 200% where the relative bandwidth bwr is obtained by extracting a frequency bandwidth between two frequencies at which the value of  $\mu''$  is 50% of the maximum  $\mu'_{\max}$  and normalizing the frequency bandwidth at the center frequency thereof.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan Dinh  
November 19, 2004.

  
KAMMIE CUNEO  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800